WEATHER IN THE UNITED STATES

GENERAL CONDITIONS

From the agricultural viewpoint the outstanding feature of the month was the return of higher temperatures in the great interior valleys and the resulting gain in the quantity of corn that will be realized from the 1927 planting. The usual details are presented in the text and charts which follow. *A. J. H.*

CYCLONES AND ANTICYCLONES

Low-pressure areas were more numerous than usual, 22 being of sufficient importance to track. There were one or possibly two which might be classed as tropical disturbances, but nothing resembling a hurricane west of Bermuda.

Eight high-pressure areas were plotted, but these were important only during the second half of the month, when two energetic HIGHS pushed southeastward from Alaska and northwest Canada.—*W. P. Day.*

THE WEATHER ELEMENTS

By P. C. DAY

PRESSURE AND WINDS

The marked feature of the weather for September, 1927, was the general redistribution of the pressure conditions whereby the cool weather prevailing almost continuously during the preceding month over most interior and eastern districts was largely reversed in the first two decades of September. During this period atmospheric pressures were in the main comparatively low along the northern border and higher to the southward, with resulting southerly winds and warm weather over nearly all districts from the Rocky Mountains eastward. In addition to this may be mentioned the marked depression of the barometer attending a cyclone that moved from Kansas and Nebraska northeasterly toward the upper Lakes on the 29th, during the early afternoon on which date a destructive tornado occurred at St. Louis, Mo., and some near-by localities, the dull details of which appear elsewhere in this REVIEW.

During the greater part of the first two decades the cyclonic circulation was weak and few low-pressure areas extended into the central valleys or to the eastward and but little precipitation occurred, except locally along the Atlantic coast on the 1st and 2d, in connection with the northward movement of a barometric depression that appeared off the middle Atlantic coast on the 1st and later moved inland over New England, giving some heavy rains over eastern New York and portions of New England; and over the central valleys and Great Lakes region from the 6th to 9th in connection with a shallow barometric depression over these regions. Also from the 10th to 12th there was more or less precipitation along the entire Atlantic coast, extending into the Alleghany Mountains and portions of the Ohio Valley and lower Lake region. At the same time there was rather wide spread precipitation in the far West, extending eastward into the Rocky Mountain districts and northern Great Plains on the 13th and 14th.

On the 18th there was considerable precipitation over a narrow belt from Arizona northeastward to the upper Lake region, and during the following two days the precipitation area extended into portions of the eastern districts, the falls becoming heavier and more general over the Atlantic Coast States.

A widespread area of precipitation, mostly light, however, with considerable snow, overspread the northern half of the country from the Plateau region to the middle Plains and upper Lakes on the 25th, the rain area extending southward and slightly eastward during the following two days, finally developing into a storm of some importance over the Lake region on the 28th. During the following 24 hours another storm that had developed over Wyoming on the 28th moved to Nebraska and thence to the Lake Superior district during the 29th and 30th, attended on the 29th at points in Iowa by sea-level pressures as low or even lower than ever before observed in September and by local storms, among the severest of which was the tornado at St. Louis, Mo. Also rains were the most general of the month on these days over a wide area from the northern and middle Plains eastward to the lower Lakes and Ohio Valley, the falls being particularly heavy in the middle Mississippi and lower Ohio Valleys.

The most important anticyclone of the month, measuring its effects on the general weather existing at the time, appeared first in the United States on the morning of the 18th over the northern Rocky Mountain districts; then moved southward and eastward into the central valleys, bringing important changes in temperature, and was further reinforced on the 20th, when temperature falls of 20° or more occurred over portions of the upper Missouri Valley, and the first general frosts of the season were reported at exposed points in Montana and Wyoming and thence eastward into western Minnesota and northern Iowa. The high-pressure area remained somewhat stationary over the Missouri Valley and near-by areas for several days during the early part of the third decade, attended by local frosts at scattered, exposed points in the upper Mississippi Valley and near-by areas. This anticyclone gradually drifted eastward with rising temperature, but was followed on the 25th by another that entered the upper Missouri Valley and near-by areas, with temperature falls of 20° or more in North Dakota and eastern Montana, followed by similar temperature changes during the following day to the southward as far as the Panhandle of Texas and western Oklahoma, but accompanied by general rains or snows which prevented severe freezing. Cloudy, rainy weather over the districts to the southward and eastward prevented any further important lowering of the temperature in near-by areas, and there was a general reaction to higher temperatures over most districts toward the end of the month.

The average pressure over both the United States and Canada, as far as observations disclose, was below the normal for September nearly everywhere, the depression being most pronounced in the middle and northern portions of the United States.

Comparison with the average pressure for the preceding month is shown on the inset to Chart II of this REVIEW.

Under the atmospheric pressure conditions existing, the prevailing winds were mainly from southerly points during much of the month from the Great Plains eastward, save that they were frequently from northeast to east over the South Atlantic and East Gulf States. West of the Rocky Mountains they were locally from the northwest over the Pacific coast districts, from southerly points in portions of the Plateau, and variable elsewhere.

Details regarding the severe storms of the month, which were compartively infrequent save in portions of the upper Mississippi Valley and near-by areas on the 29th, appear in the tables at the end of this section.

TEMPERATURE

The temperature was marked by wide extremes over the different portions of the month and country, the first half being unusually warm over most districts from the Rocky Mountains eastward, while the latter part was distinctly cool in this region; also the far western portions had a period of decided coolness in the second decade.

By weeks the temperature conditions are outlined in the main by the following résumé:

About the beginning of the first week there was a marked rise in temperature over all central and most eastern districts, the daily values rising above normal for the first time in several weeks over this region, and the week was mainly warmer than normal, but to a slight degree only, over much of the far West, though the Plateau region was usually moderately cool. The second week continued warm over the districts from the Rocky Mountains eastward, the period being particularly warm in the great central valleys where the weekly means ranged from 5° to 18° above the normal and the latter part of the week had temperatures in many cases the highest of record so late in the month. West of the Rockies this week was distinctly cool, some portions of the Plateau having weekly means from 8° to 12° below normal.

The greater part of the third week continued unusually warm in the eastern two-thirds of the country, though toward the end cooler weather set in over the Rocky Mountain and near-by areas and gradually extended eastward so that by the close temperatures were mainly below normal over all districts from the Rocky Mountains eastward. This week continued moderately cool over the far West.

The fourth week was mainly cool from the Rocky Mountains eastward during the first half, but thereafter there was a reaction to warmer over the central valleys and southern portions, but by the 25th decidedly cool weather had again overspread the Missouri Valley and near-by districts, and during the following few days the lowest temperatures of the month were recorded at local points in the Plains States and southern Rocky Mountain region. The last few days of the month had in the main temperatures near normal in practically all portions of the country.

The average temperatures for the month as a whole were above normal from the eastern slope of the Rocky Mountains to the Atlantic coast, save locally in the northern portions of New York and New England where a few points had averages slightly below. They were above normal also over the whole of southern Canada and along the Pacific coast from central California northward. In the central valleys the averages were from 2° to 5° above normal, and over much of this area they were from 2° to 3° higher than for the preceding August.

From the Rocky Mountains westward to the Pacific, save as indicated above, the September averages were below normal, though not materially so save in the central Plateau region.

PRECIPITATION

Considering the country as a whole, the month was drier than normal, the lack of rain being quite pronounced over the Atlantic and Gulf States where the monthly deficiencies ranged up to more than two inches, and locally the amounts were the least or nearly so of record for the month. On the other hand, precipitation was distinctly above normal in the Lake region and to westward of the Rocky Mountains, except for California and Nevada where the State averages were slightly less than normal. At Cairo, Ill., and Portland, Oreg., the monthly amounts were the greatest for September in the 55 years of record.

SNOWFALL

Such snow as fell was confined mainly to the middle and northern Rocky Mountain and near-by areas and occurred chiefly on the 25th and 26th. In Colorado the total falls ranged from traces at low elevations to as much as 25 inches on some of the high mountains. The amounts were less in Wyoming and the near-by areas of Montana and in the Black Hills of South Dakota. In western Nebraska the depths ranged up to 5 inches or more, and western Kansas had smaller amounts. In some of these areas the snowfall for the month was not only the first but the greatest ever observed in September. Slight falls were recorded locally at a few points in other western mountain districts and locally from North Dakota to the upper Lake region.

The highest temperatures of the month occurred mainly from about the 15th to 18th, though in portions of the Southwest they occurred on the 1st, and over much of the remaining territory to westward of the Rocky Mountains from the 3d to 6th.

In many districts from the Great Plains eastward the maximum temperatures during the first half of the second decade were the highest ever recorded so late in the month and in some cases the actual highest ever recorded in September, and the daily averages during portions of the period frequently covered the longest periods of continuously high temperatures ever known in the month.

Temperatures above 100° were recorded at some time during the warm period in practically all the States save from the Great Lakes and Ohio eastward and a few in the far Northwest, where they were slightly less.

The lowest temperatures of the month occurred mainly during the last decade and chiefly during the first half of it.

Frosts occurred generally in the northern Rocky Mountains and eastward over portions of the Plains States on the morning of the 20th, about the normal date for the first frosts in that region, but thereafter there was little additional frost, and at the end of the month freezing weather or killing frosts had not yet occurred over any important agricultural sections of the country.

RELATIVE HUMIDITY

In the areas of deficient rainfall in the Atlantic and Gulf States the percentages of relative humidity were less than normal and distinctly so from eastern Texas to the South Atlantic coast. Smaller deficiencies occurred in California and locally in the Lake region and Ohio Valley. Elsewhere the percentages were mainly above the normal, and they were unusually high in the Rocky Mountain districts and far Northwest.